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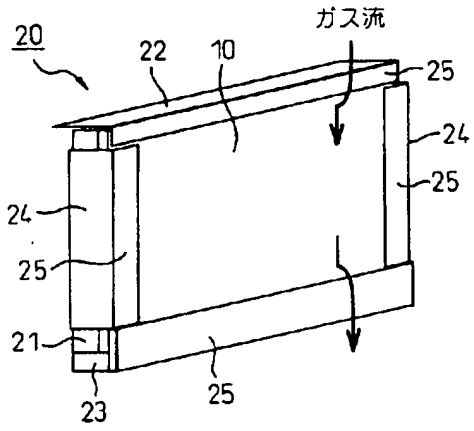
(54)【発明の名称】　ＣＶＤ，ＡＬＥ装置用ガラス基板収納治具

(57)【要約】
【課題】　成膜ガスのガラス基板裏面への回り込みと、ガラス基板の割れ・欠けを防止したＣＶＤ，ＡＬＥ装置用ガラス基板収納治具を提供する。
【解決手段】　本発明のＣＶＤ，ＡＬＥ装置用ガラス基板収納治具２０は、ガラス基板１０の裏面を支持する裏面支持部２１と、ガラス基板の４つの側面を支える上部カバー部２２、下部支持部２３及び左右側面支持部２４とより構成され、そのうち少なくともガス流の下流に位置する下部支持部が下辺表面を覆う押え壁２５を有している。押え壁のガラス基板に接しない方の端部２６は、流線形に形成される。ガラス基板を挟持する裏面支持部と押え壁との間隔は、可変となっている。

図１



【特許請求の範囲】
【請求項１】　原料ガスを使用して反応容器内で薄膜形成されるガラス基板を支持するためのＣＶＤ，ＡＬＥ装置用ガラス基板収納治具において、この収納治具が、
ガラス基板の裏面を支持する裏面支持部と、
ガラス基板の４つの側面を支える上部カバー部、下部支持部及び左右側面支持部と、より構成され、
少なくともガス流の下流に位置する該下部支持部がガラス基板の下辺表面を覆う押え壁を有していることを特徴とするＣＶＤ，ＡＬＥ装置用ガラス基板収納治具。
【請求項２】　ガラス基板の残りの３の側面を支える上部カバー部、左右側面支持部もそれぞれガラス基板の周辺表面を覆う押え壁を有していることを特徴とする請求項１に記載のＣＶＤ，ＡＬＥ装置用ガラス基板収納治具。
【請求項３】　前記押え壁のガラス基板と接する側と反対側の端部を流線形として、ガス流の抵抗を低減したことを特徴とする請求項１又は２に記載のＣＶＤ，ＡＬＥ装置用ガラス基板収納治具。
【請求項４】　ガラス基板を挟持する前記押え壁と前記裏面支持部との間隔が可変となっていることを特徴とする請求項１～３のいずれか一項に記載のＣＶＤ，ＡＬＥ装置用ガラス基板収納治具。
【請求項５】　前記押え壁と前記裏面支持部との間を可変とする機構が、ボルトを挿通する穴を有する円筒状カラーを、少なくとも前記下部支持部に穿孔された、カラーの外径よりやや大きい径の孔内に配置し、該カラーを利用して前記下部支持部と前記裏面支持部とをボルトで締結することよりなることを特徴とする請求項４に記載のＣＶＤ，ＡＬＥ装置用ガラス基板収納治具。
【請求項６】　ガラス基板が２枚一組として裏面支持部の両側で保持されていることを特徴とする請求項１～５のいずれか一項に記載のＣＶＤ，ＡＬＥ装置用ガラス基板収納治具。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は、半導体素子の製造プロセスにおけるガラス基板への薄膜形成、例えば金属膜、酸化膜などの成膜を行ったり、或いはガラス基板への単結晶層のエピタキシャル成膜を行なう半導体成膜装置における反応容器内でのガラス基板の収納治具に関するものである。
【０００２】
【従来の技術】ガラス基板に絶縁膜を形成するＣＶＤやＡＬＥ（Atomic Layer Epitaxy）装置等では、約３００℃以上の高温が大型ガラス基板に印加される場合がある。このような大型ガラス基板をＡＬＥ装置にて処理する場合、反応容器内での大型ガラス基板の支持として、熱変形を考慮すると図７のようにガラス面を点で支持する方法が容易に考えられる。これは、台座Ａに固定された位置決めピンＢによってガラス基板Ｃを支持する方法である。この場合、反応容器内の成膜ガスがガラス基板の裏面に容易に回り込んでしまうため、ガラス基板の一部しか正常部が得られなかったり、成膜後に膜を剥離するという余分な工程を必要とするという問題があった。
【０００３】また、このガラス基板の裏面への成膜ガスの回り込みを防止するには、シール性を向上させれば良く、ガラス基板の周囲と裏面とをシール材でシールする方法が考えられる。しかし、ＣＶＤやＡＬＥ装置等で３００℃以上の高温が印加される場合は、ゴム等の軟弱なシール部品が適用できず、金属によるシール即ちガラスと金属を接触させることが必須となっている。しかしながら、高温下においては金属とガラスの線膨張係数の違いによるガラス基板とこれを保持する治具との温度変形差により、ガラスの欠け・割れが発生してしまう。生産効率を向上するために、ガラス基板が大型化すると特にこの問題は重要である。
【０００４】
【発明が解決しようとする課題】本発明の目的は、このガスのガラス基板の回り込みによるガラス基板裏面への成膜量が、ガス流の方向とガスの乱流とに相関関係があることに着目し、ガラス基板の割れ・欠けとガラス基板裏面への成膜との２つの問題を解決したＣＶＤ，ＡＬＥ装置用ガラス基板収納治具を提供することである。
【０００５】
【課題を解決するための手段】本発明は、前記課題を解決するための手段として、特許請求の範囲の各請求項に記載のＣＶＤ，ＡＬＥ装置用ガラス基板収納治具を提供する。請求項１に記載のＣＶＤ，ＡＬＥ装置用ガラス基板収納治具は、ガラス基板の４つの側面を支える上部カバー部、下部支持部及び左右側面支持部のうち少なくともガス流の下流に位置する下部支持部がガラス基板の下辺表面を覆う押え壁を有することにより、ガス流下流に位置するガラス基板の下部でのガラス基板裏面への回り込むガス量が最も多い回り込みを防止でき、正常な成膜部が多くなり、生産性が向上する。
【０００６】請求項２の該収納治具は、ガラス基板の４つの側面を支える上部カバー部、下部支持部及び左右側面支持部とを備えていて、上部カバー部、下部支持部及び左右側面支持部の各々が、ガラス基板の各周辺表面を覆う押え壁を有することにより、ガラス基板の各周辺でのガス流の回り込みが防止でき、ガス流の回り込みが更に改善される。請求項３の該収納治具は、押え壁のガラス基板と接する側と反対側の端部を流線形にしたものであり、ガス流が押え壁の端部に当って乱流となることを低減でき、ガス流が押え壁の流線形に沿ってスムーズに流れるので、ガス流のガラス基板裏面への回り込みが一層改善される。
【０００７】請求項４の該収納治具は、ガラス基板を挟持する押え壁と裏面支持部との間隔を可変することで、

成膜中の熱による材料の熱膨張差による変形を吸収でき、ガラス基板の割れ・欠けを防止できる。更にガラス基板をセットする際に挿入部位（間隔）を拡げ、挿入後に該部位を狭めることで、セット時のガラス基板の割れ・欠けも防止できる。請求項5の該収納治具は、前記押え壁と前記裏面支持部との間隔を可変にする機構を具体化したものであり、請求項4と同様の作用効果を奏する。請求項6の該収納治具は、ガラス基板を2枚一組として裏面支持部の両側で支持することにより、ガラス基板を効率よく支持でき、ほぼ2倍の生産効率を上げることができる。

【0008】

【発明の実施の形態】以下図面を参照して、本発明の実施の形態のCVD，ALE装置用ガラス基板収納治具について説明する。一般にCVD，ALE装置においては、図6に示すように反応容器1内に成膜するガラス基板10を収納した収納治具20を載置する支持台2が設けられ、反応容器1には原料ガスを供給するための供給管3とガスを排気するための排気管4が接続されている。このガラス基板10は、垂直状又は水平状或いは傾斜状に多数並置される。供給される原料ガス、例えば$AlCl_3$，$TiCl_2$等は、反応容器1内の高温雰囲気中で同じく供給された水（H_2O）と反応し、ガラス基板10上にAl_2O_3又はTiO_2等の膜を生成すると同時にガス状の副生成物を発生する。これが排気管4から排気される。

【0009】図1は、本発明の実施の形態のガラス基板収納治具20を示している。収納治具20は、ガラス基板10の裏面を支える裏面支持部21と、ガラス基板10の4つの側面を支える上部カバー部22、下部支持部23及び側面支持部24とから構成されている。更にこれら上部カバー部22、下部支持部23及び側面支持部24は、ガラス基板10の表面周辺を覆うための押え壁25をそれぞれ有している。したがって、図2，3に示されるように、ガラス基板10は、裏面支持部21と押え壁25とにより挟持されるようになる。この押え壁25は、それぞれ対応する上部カバー部22、下部支持部23及び側面支持部24に一体に形成されてよく、又は別体として形成され溶接、ボルト等により固着してもよい。また、図示されてはいないが、裏面支持部21と、上部カバー部22、下部支持部23及び側面支持部24とは、ボルト等により数個所で締結されている。

【0010】図1に示されたものでは、ガラス基板10の4辺に渡って押え壁25が設けられているが、実際にはガス流は下流に位置するガラス基板10の下部から裏面に回り込むのが最も多く、図2に示されるように、ガラス基板10の裏面支持部21と、押え壁25を有する下部支持部23のみを設けるだけで、かなりの効果を上げることができるものである。

【0011】図3は、押え壁25の別の実施の形態を示すもので、ここでは押え壁25のガラス基板10と接しない方の端部26を流線形にしている。これは、図2のように押え壁25の該端部26が角部を形成していると、ガス流がこの角部に当って乱流を発生し、押え壁25とガラス基板10との隙間から入り込みガラス基板10の裏面にいくらか回り込むために、このガス漏れを更に防止するために流線形にしたものである。これにより、ガス流はスムーズになり、乱流の発生が押えられる。なお、図3に示されるように下部支持部23の下端部も流線形にすると一層効果が上がる。

【0012】図4の（a）は、更に別の実施の形態を示すもので、押え壁25と裏面支持部21と間隔を可変にする構造としている。これは成膜中の熱によるガラス基板10と収納治具20との熱膨張差から、この間隔が不規則に変形する。そこでガラス基板10の側面の支持部である上部カバー部22、下部支持部23及び側面支持部24と裏面支持部21との締結を、溶接等の完全固定式から数㎜程度ずれて可動する構造とすることで、この変形を吸収しガラスの割れ・欠けを防止するようにしている。

【0013】図4の（b）は、この1つの実施例を示している。下部支持部23には、裏面支持部21に締結するための孔27が穿設される。ボルト等の締結具30を挿通する穴31が明けられた円筒状のカラー32が、下部支持部23の孔27内に配置される。孔27の内径は、カラー32の外径より大きく、カラー32が横方向に数㎜程度移動できる大きさとなっている。カラー32の前後には孔27より大きな径のワッシャー33が配置される。このような状態で、締結具30をワッシャー33及びカラー32を挿通し、裏面支持部21のねじ穴に螺合することで裏面支持部21と下部支持部23とが締結される。このような締結個所がガラス基板10の1側辺当り数個所設けられる。なお、下部支持部23の表面からワッシャー33が突出しないように、下部支持部23の表面にはワッシャー33の収容部が形成されている。この構造により下部支持部23は裏面支持部21に対して横方向に数㎜程度移動できる。即ち裏面支持部21と押え壁25との間隔が可変にできるものである。従って、ガラス基板の大型化によって厳しくなった熱膨張差による変形の影響を排除できる。

【0014】前記のように下部支持部23と裏面支持部21との可動構造は、大型ガラス基板10をセットする際に、裏面支持部21と押え壁25とで形成される挿入部位を拡げ、ガラス基板を挿入後に手で押す等によって狭めることで、セット時のガラスの欠け・割れを防止することもできる。なお、下部支持部23以外の上部カバー部22及び側面支持部24にも、前記の裏面支持部21との可動構造を採用できるものである。

【0015】図5は更に別の実施の形態を示すもので、裏面支持部21の両面にガラス基板10を配置したもの

である。当然、この場合には押え壁２５は、上部カバー部２２、下部支持部２３及び側面支持部２４とも両側に設けられている。また、前記した押え壁２５の端部２６の流線形化及び裏面支持部２１と支持部２２，２３，２４との可動な締結構造を適宜採用できるものである。このように裏面支持部の両側を有効に利用することで、省スペースでなおかつ約２倍のガラス基板を収納できる。なお、本実施の形態では、ガラス基板を垂直に多数並置する場合を例にとって説明しているが、水平に多数並置する場合においても適用可能なものである。その場合は、原料ガスを反応容器内に横方向から導入して、ガス状副生成物を横方向から排出する等の工夫が必要であろう。

【００１６】以上説明したように本発明のＣＶＤ，ＡＬＥ装置用ガラス基板収納治具においては、ガラス基板の成膜の不具合部を減少できると共に大型のガラス基板であっても割れ・欠けを防止することができ、かつ省スペースで大量のガラス基板を収納できるので、１バッチの処理時間が約１２時間程かかるＣＶＤ，ＡＬＥ装置にあっては、その生産効率を格段に改善できるものである。

【図面の簡単な説明】

【図１】本発明の実施の形態のＣＶＤ，ＡＬＥ装置用ガラス基板収納治具の斜視図である。

【図２】本発明の収納治具の一部側面拡大図である。

【図３】本発明の別の実施の形態の収納治具の一部側面拡大図である。

【図４】（ａ）は本発明の更に別の実施の形態の収納治具の一部側面拡大図で、（ｂ）はその一実施例を示す一部側面拡大断面図である。

【図５】本発明の更に別の実施の形態の収納治具の一部側面拡大図である。

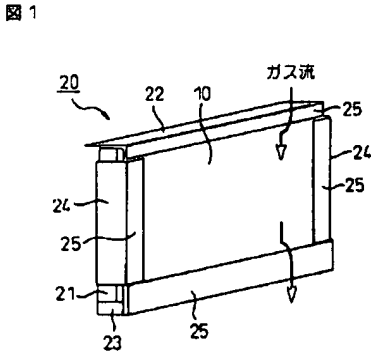
【図６】ＣＶＤ，ＡＬＥ装置の反応容器内に配置されたガラス基板収納治具を概念的に説明する図である。

【図７】従来のガラス基板収納治具を説明する図である。

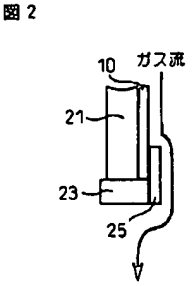
【符号の説明】

１０…ガラス基板
２０…収納治具
２１…裏面支持部
２２…上部カバー部
２３…下部支持部
２４…側面支持部
２５…押え壁
２６…端部
３０…締結具
３２…カラー
３３…ワッシャー

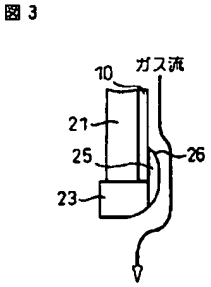
【図１】



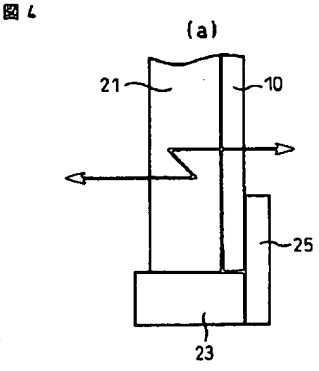
【図２】



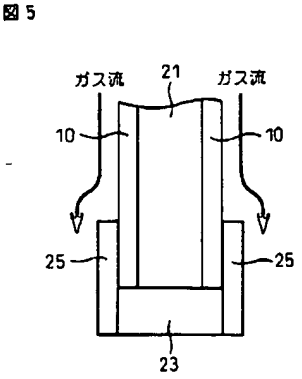
【図３】

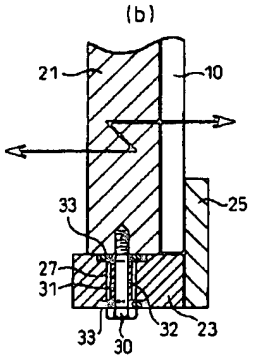


【図４】



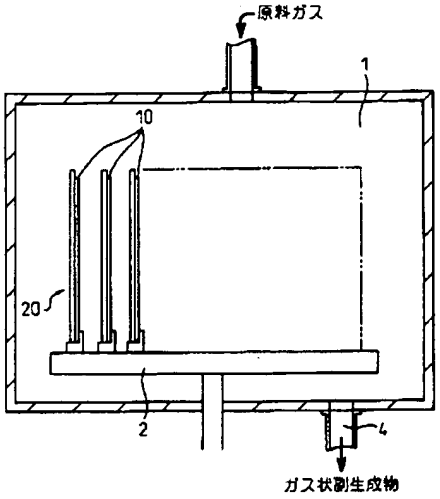
【図５】





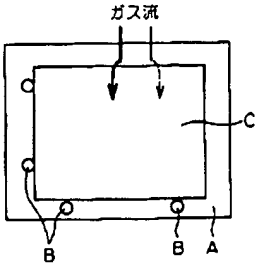
【図6】

図5



【図7】

図7



フロントページの続き

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[Theme code (reference)]
4G077.
4K030.
5F045.
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[Translation done.]

* NOTICES *

Summary.

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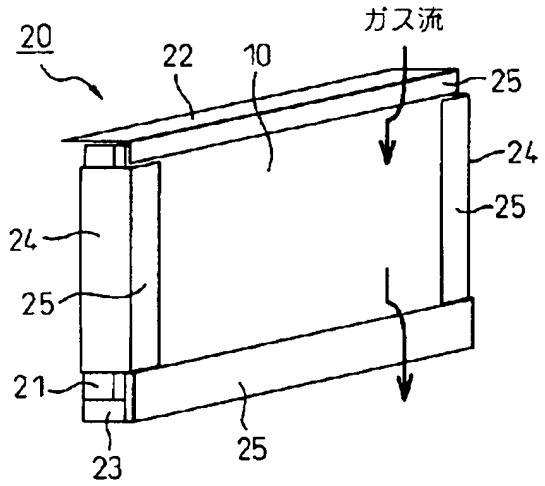
(57) [Abstract]
[Technical problem] CVD and the glass-substrate receipt fixture for ALE equipments which prevented the wraparound on the rear face of a glass substrate of membrane formation gas, and the crack and chip of a glass substrate are offered.
[Means for Solution] The lower supporter which CVD of this invention and the glass-substrate receipt fixture 20 for ALE equipments consist of a rear-face supporter 21 which supports the rear face of a glass substrate 10, and the up covering section 22,

the lower supporter 23 and the left-and-right-laterals supporter 24 supporting four sides of a glass substrate, among those is located in the lower stream of a river of a gas stream at least has the wrap presser-foot wall 25 for the lower side front face. The edge 26 of the direction which does not touch the glass substrate of a presser-foot wall is formed in a streamline. It presses down with the rear-face supporter which pinches a glass substrate, and the interval with a wall serves as adjustable.

[Translation done.]

図 1



[Translation done.]

* NOTICES *

CLAIMS

[Claim(s)]
[Claim 1] In CVD for supporting the glass substrate by which thin film formation is carried out within a reaction container using material gas, and the glass-substrate receipt fixture for ALE equipments The rear-face supporter with which this receipt fixture supports the rear face of a glass substrate, and the up covering section, lower supporter and left-and-right-laterals supporter supporting four sides of a glass substrate, CVD, the glass-substrate receipt fixture for ALE equipments which are characterized by this lower supporter that is constituted more and located in the lower stream of a river of a gas stream at least having the wrap presser-foot wall for the lower side front face of a glass substrate.
[Claim 2] CVD according to claim 1 to which the up covering section supporting the remaining sides of 3 of a glass substrate and a left-and-right-laterals supporter are also characterized by having the wrap presser-foot wall for the circumference front face of a glass substrate, respectively, the glass-substrate receipt fixture for ALE equipments.
[Claim 3] CVD according to claim 1 or 2 characterized by reducing resistance of a gas stream by making the edge of an opposite side into a streamline the side which touches the glass substrate of the aforementioned presser-foot wall, the glass-substrate receipt fixture for ALE equipments.
[Claim 4] CVD given in any 1 term of the claims 1-3 characterized by the interval of the aforementioned presser-foot wall and the aforementioned rear-face supporter which pinch a glass substrate serving as adjustable, the glass-substrate receipt fixture for ALE equipments.
[Claim 5] the hole of a path with a little large mechanism which makes adjustable between the aforementioned presser-foot wall and the aforementioned rear-face supporters than the outer diameter of a color punched by the aforementioned lower supporter at least in the cylinder-like color which has the hole which inserts in a bolt -- CVD according to claim 4 characterized by the bird clapper from arranging inside and concluding the aforementioned lower supporter and the aforementioned rear-face supporter with a bolt using this color, and the glass-substrate receipt fixture for ALE equipments
[Claim 6] CVD given in any 1 term of the claims 1-5 characterized by holding the glass substrate on both sides of a rear-face supporter as a two-sheet lot, the glass-substrate receipt fixture for ALE equipments.

[Translation done.]

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] this invention forms the thin film formation to the glass substrate in the manufacture process of a semiconductor device, for example, a metal membrane, an oxide film, etc., or relates to the receipt fixture of the glass substrate within the reaction container in the semiconductor membrane formation equipment which performs epitaxial membrane formation of the single crystal layer to a glass substrate.
[0002]
[Description of the Prior Art] With CVD and ALE (Atomic Layer Epitaxy) equipment which form an insulator layer in a glass substrate, the elevated temperature of about 300 degrees C or more may be impressed to a large-sized glass substrate. When processing such a large-sized glass substrate with ALE equipment, if heat deformation is taken into consideration, the method of supporting a glass side at a point like drawing 7 will be easily considered as support of the large-sized glass substrate within a reaction container. This is the method of supporting glass-substrate C by gage-pin B fixed to Plinth A. In this case, since the membrane formation gas in a reaction container turned to the rear face of a glass substrate easily, there was a problem that some glass substrates needed the excessive process of the normal section not being obtained or exfoliating a film after membrane formation.
[0003] Moreover, in order to prevent the wraparound of the membrane formation gas to the rear face of this glass substrate, how to carry out the seal of the circumference and the rear face of a glass substrate by the sealant can be considered that what is necessary is just to raise seal nature. However, when the elevated temperature of 300 degrees C or more is impressed with CVD, ALE equipment, etc., it is indispensable to be unable to apply weak seal parts, such as rubber, but to contact a metal, the seal, i.e., the glass, by the metal. However, the chip and crack of glass will occur under an elevated temperature according to the temperature deformation difference of the glass substrate by the difference in the coefficient of linear expansion of a metal and glass, and the fixture holding this. In order to improve productive efficiency, if a glass substrate is enlarged, especially this problem is important.

[0004]
[Problem(s) to be Solved by the Invention] The purpose of this invention is that the amount of membrane formation on the rear face of a glass substrate by the wraparound of the glass substrate of this gas offers CVD and the glass-substrate receipt fixture for ALE equipments which solved two problems with the membrane formation to the crack and chip, and glass-substrate rear face of a glass substrate paying attention to there being a correlation in the direction of a gas stream, and the turbulent flow of gas.
[0005]
[Means for Solving the Problem] this invention provides each claim of a claim with CVD of a publication, and the glass-substrate receipt fixture for ALE equipments as the aforementioned The means for solving a technical problem. CVD according to claim 1 and the glass-substrate receipt fixture for ALE equipments The lower supporter located in the lower stream of a river of a gas stream at least among the up covering section supporting four sides of a glass substrate, a lower supporter, and a left-and-right-laterals supporter the lower side front face of a glass substrate by having a wrap presser-foot wall A wraparound with most capacity on the rear face of a glass substrate in the lower part of the glass substrate located in a gas-stream lower stream of a river around which it turns can be prevented, the normal membrane formation section increases, and productivity improves.
[0006] When this receipt fixture of a claim 2 is equipped with the up covering section, lower supporter, and left-and-right-laterals supporter supporting four sides of a glass substrate and each of the up covering section, a lower supporter, and a left-and-right-laterals supporter has a wrap presser-foot wall for each circumference front face of a glass substrate, the wraparound of the gas stream in each [of a glass substrate] circumference can be prevented, and the wraparound of a gas stream is improved further. Since this receipt fixture of a claim 3 makes the edge of an opposite side a streamline the side which touches the glass substrate of a presser-foot wall, a gas stream presses it down, it can reduce a turbulent flow and a bird clapper in the edge of a wall, and a gas stream presses it down and it flows smoothly along with the streamline of a wall, the wraparound on the rear face of a glass substrate of a gas stream is improved further.
[0007] This receipt fixture of a claim 4 is carrying out adjustable [of the interval of the presser-foot wall and rear-face supporter which pinch a glass substrate], can absorb deformation by the differential thermal expansion of the material by the heat under membrane formation, and can prevent the crack and chip of a glass substrate. Furthermore, in case a glass substrate is set, an insertion site (interval) is extended, and the crack and chip of the glass substrate at the time of a set can also be prevented by narrowing this part after insertion. This receipt fixture of a claim 5 materializes the mechanism which makes adjustable the interval of the aforementioned presser-foot wall and the aforementioned rear-face supporter, and

does so the same operation effect as a claim 4. By supporting on both sides of a rear-face supporter by making a glass substrate into a two-sheet lot, this receipt fixture of a claim 6 can support a glass substrate efficiently, and can gather twice [about] as many productive efficiency as this.

[0008]

[Embodiments of the Invention] With reference to a drawing, CVD of the form of operation of this invention and the glass-substrate receipt fixture for ALE equipments are explained below. Generally, as CVD and ALE equipment are shown in drawing 6 , the susceptor 2 which lays the receipt fixture 20 which contained the glass substrate 10 which forms membranes in the reaction container 1 is formed, and the exhaust pipe 4 for exhausting the supply pipe 3 and gas for supplying material gas is connected to the reaction container 1. A majority of these glass substrates 10 are juxtaposed the shape of the shape of a perpendicular, and level, or in the shape of an inclination. the material gas 3 supplied, for example, AlCl, and TiCl2 etc. -- the water (H2 O) similarly supplied in the elevated-temperature atmosphere in the reaction container 1 -- reacting -- a glass-substrate 10 top -- aluminum 2O3 Or TiO2 etc. -- a gas-like by-product is generated at the same time it generates a film This is exhausted from an exhaust pipe 4.

[0009] Drawing 1 shows the glass-substrate receipt fixture 20 of the form of operation of this invention. The receipt fixture 20 consists of a rear-face supporter 21 supporting the rear face of a glass substrate 10, and the up covering section 22, the lower supporter 23 and the side supporter 24 supporting four sides of a glass substrate 10. Furthermore, these up covering section 22, the lower supporter 23, and the side supporter 24 have the presser-foot wall 25 of a wrap sake for the circumference of surface of a glass substrate 10, respectively. Therefore, as shown in drawing 2 and 3, a glass substrate 10 is pressed down with the rear-face supporter 21, and comes to be pinched with a wall 25. This presser-foot wall 25 may be formed in the up covering section 22, the lower supporter 23, and the side supporter 24 which correspond, respectively at one, or is formed as another object, and may fix with welding, a bolt, etc. Moreover, although not illustrated, the rear-face supporter 21, and the up covering section 22, the lower supporter 23 and the side supporter 24 are partly concluded with the bolt etc. in the place.

[0010] In fact, although it presses down over four sides of a glass substrate 10 and the wall 25 is established, as it turns to a rear face in most cases from the lower part of the glass substrate 10 located down-stream and is shown in drawing 2 , a gas stream can only form only the rear-face supporter 21 of a glass substrate 10, and the lower supporter 23 which has the presser-foot wall 25, and can raise a remarkable effect in what was shown in drawing 1 .

[0011] Drawing 3 shows the form of another operation of the presser-foot wall 25, and makes the streamline the edge 26 of the direction which presses down here and does not touch the glass substrate 10 of a wall 25. If it presses down like drawing 2

and this edge 26 of a wall 25 forms the corner, in order that a gas stream may generate a turbulent flow in this corner, may enter from the crevice between the presser-foot wall 25 and a glass substrate 10 and may turn around some to the rear face of a glass substrate 10, this is made into a streamline in order to prevent this gas leakage further. Thereby, a gas stream becomes smooth and generating of a turbulent flow is pressed down. In addition, if the soffit section of the lower supporter 23 is also made into a streamline as shown in drawing 3 , an effect will go up further.

[0012] (a) of drawing 4 shows the form of still more nearly another operation, and is taken as the structure which makes adjustable the presser-foot wall 25, the rear-face supporter 21, and an interval. From the differential thermal expansion of the glass substrate 10 and the receipt fixture 20 by the heat under membrane formation, this deforms this interval irregularly. Then, this deformation is absorbed and it is made to prevent the crack and chip of glass by considering as the structure which shifts from perfect fixed [, such as welding,] about several mm, and carries out movable [of the conclusion with the up covering section 22, the lower supporter 23 and the side supporter 24 which are a supporter of the side of a glass substrate 10, and the rear-face supporter 21].

[0013] (b) of drawing 4 shows this one example. The hole 27 for concluding to the rear-face supporter 21 is drilled by the lower supporter 23. The color 32 of the shape of a cylinder in which the hole 31 which inserts in the conclusion implements 30, such as a bolt, broke is arranged in the hole 27 of the lower supporter 23. The bore of a hole 27 is larger than the outer diameter of a color 32, and the color 32 serves as a size which can move to a longitudinal direction about several mm. Before and behind a color 32, the washer 33 of a bigger path than a hole 27 is arranged. The rear-face supporter 21 and the lower supporter 23 are concluded by inserting in a washer 33 and a color 32 and screwing the conclusion implement 30 in the tapped hole of the rear-face supporter 21 in such the state. Such several conclusion parts per 1 side side of a glass substrate 10 are established. In addition, a washer 33 projects and bends from the front face of the lower supporter 23, and the hold section of a washer 33 is formed in the front face of the lower supporter 23 like. The lower supporter 23 is movable to a longitudinal direction about several mm to the rear-face supporter 21 with this structure. That is, it presses down with the rear-face supporter 21, and an interval with a wall 25 is made to adjustable. Therefore, the influence of deformation by the differential thermal expansion which became severe by enlargement of a glass substrate can be eliminated.

[0014] As mentioned above, in case it sets the large-sized glass substrate 10, the movable structure of the lower supporter 23 and the rear-face supporter 21 extends the insertion site which presses down with the rear-face supporter 21 and is formed with a wall 25, is narrowing by pushing by hand, after inserting a glass substrate etc., and can also prevent th chip and crack of the glass at the time of a set. In addition, movable structure with the aforementioned rear-face supporter 21 is employable also

as the up covering sections 22 and the side supporters 24 other than lower supporter 23.

[0015] Drawing 5 shows the gestalt of still more nearly another operation, and arranges a glass substrate 10 to both sides of the rear-face supporter 21. Naturally, in this case, as for the presser-foot wall 25, the up covering section 22, the lower supporter 23, and the side supporter 24 are formed in both sides. Moreover, it is said thing which presses down and can adopt suitably streamline-izing of the edge 26 of a wall 25, and the movable conclusion structure of the rear-face supporter 21 and supporters 22, 23, and 24. thus, the thing for which the both sides of a rear-face supporter are used effectively -- a ** space -- in addition -- and a twice [about] as many glass substrate as this can be contained In addition, although the gestalt of this operation explains the glass substrate taking the case of the case where a large number are juxtaposed perpendicularly, when juxtaposing a large number horizontally, it can apply. In this case, probably, the device of introducing material gas from a longitudinal direction in a reaction container, and discharging a gas-like by-product from a longitudinal direction will be required.

[0016] as explained above, since a crack and a chip can be prevented and a lot of glass substrates can be contained in a ** space even if it is a large-sized glass substrate, while being able to decrease the fault section of membrane formation of a glass substrate in CVD of this invention, and the glass-substrate receipt fixture for ALE equipments, if about about 12 hours of processing times of one batch are in this CVD and ALE equipment, the productive efficiency is boiled markedly and it can improve

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[Translation done.]

* NOTICES *

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] They are CVD of the gestalt of operation of this invention, and the perspective diagram of the glass-substrate receipt fixture for ALE equipments.

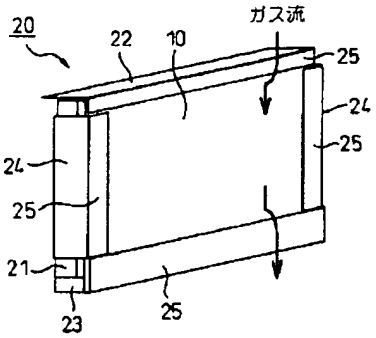
[Drawing 2] some receipt fixtures of this invention -- it is a side enlarged view
[Drawing 3] some receipt fixtures of the gestalt of another operation of this invention -- it is a side enlarged view
[Drawing 4] in (a), the receipt fixture of the gestalt of still more nearly another operation of this invention is a side enlarged view a part, and (b) shows the one example -- it is a side expanded sectional view in part
[Drawing 5] some receipt fixtures of the gestalt of still more nearly another operation of this invention -- it is a side enlarged view
[Drawing 6] It is drawing which explains notionally the glass-substrate receipt fixture arranged in the reaction container of CVD and ALE equipment.
[Drawing 7] It is drawing explaining the conventional glass-substrate receipt fixture.
[Description of Notations]
10 -- Glass substrate
20 -- Receipt fixture
21 -- Rear-face supporter
22 -- Up covering section
23 -- Lower supporter
24 -- Side supporter
25 -- Presser-foot wall
26 -- Edge
30 -- Conclusion implement
32 -- Color
33 -- Washer

[Translation done.]

* NOTICES *

DRAWINGS

[Drawing 1]
図 1



[Drawing 2]
図 2

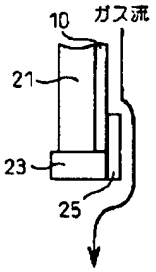


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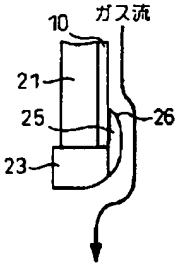
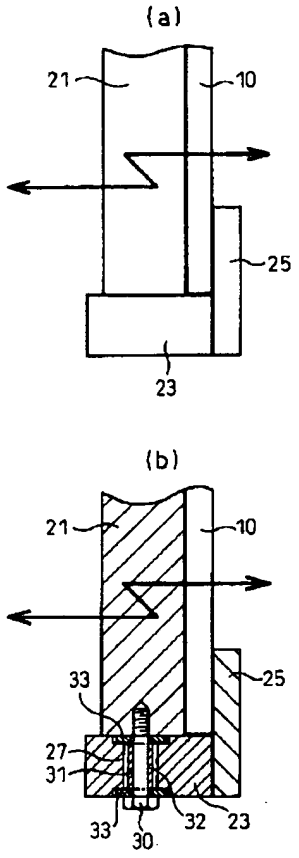
図 3



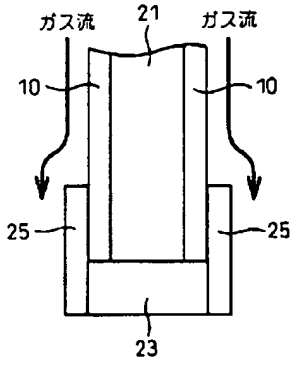
[Drawing 4]

図 4



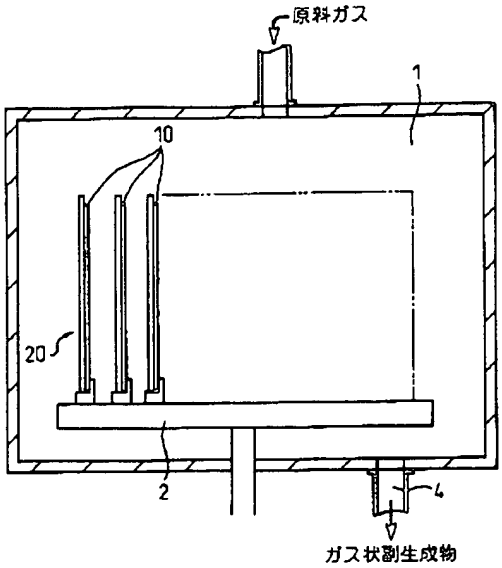
[Drawing 5]

図 5



[Drawing 6]

図6



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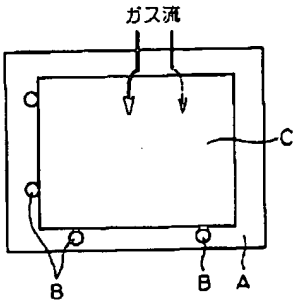

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